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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,415	07/29/2003	Todd R. Burkey	062781-0082	5964

41552 7590 02/15/2007
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EXAMINER

KIM, DANIEL Y

ART UNIT	PAPER NUMBER
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2185

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/629,415

Applicant(s)

BURKEY, TODD R.

Examiner

Daniel Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-16 is/are rejected.
- 7) ☒ Claim(s) 4,5,7,10,13 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


STEPHEN C. ELMORE
PRIMARY EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Status

1. This Office Action is in response to applicant's communication filed December 1, 2006 in response to the PTO Office Action mailed June 1, 2006. The applicant's remarks and amendments to the claims and/or the specification were considered with the results that follow.
2. In response to the last Office Action, no claims have been canceled, amended or added. Claims 1-16 remain pending in this application.

Response to Arguments

3. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
5. Claims 1 and 8-14 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for certain methods of dynamically resizing mirrored virtual disks, does not reasonably provide enablement for every possible method, as detailed below:

For claim 1, the language "manipulating RAID's in the RAID storage system to provide the desired resizing of the mirrored virtual disk" suggests that applicant has invented every possible method of resizing a mirrored virtual disk by manipulating RAID's, whereas in the specification, applicant only describes dynamically resizing mirrored virtual disks in a RAID storage system by dynamically expanding or shrinking the disks through the steps described on page 12, lines 8-20. The claim language should therefore be changed to reflect this scope appropriately.

Claims 8, 11 and 14 are rejected due to similar reasons, and should be corrected accordingly.

Claims 9-10 and 12-13 are also rejected because they inherit the deficiencies of their respective base claims without correcting them, and should be revised accordingly.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-5 and 8-16 are rejected under 35 U.S.C. 112, second paragraph for the reasons detailed below:

In claim 1, the language "manipulating RAID's in the RAID storage system to provide the desired resizing of the mirrored virtual disk" renders the claim incomplete for omitting essential steps, such omission amounting to a gap between the steps (see MPEP § 2172.01). The language indicates a missing step necessary to explain how the method accomplishes providing desired resizing of a mirrored virtual disk by manipulating RAID's. In other words, it is unclear what kind of manipulating occurs to

accomplish the resizing, and as established above, applicant may not claim every possible method of resizing a mirrored virtual disk as the claim language suggests.

Furthermore, these two ideas are unrelated in and of themselves. Simply manipulating RAIDs in a RAID storage system does not necessarily resize a mirrored virtual disk, and the necessary steps by which any such method may be made possible are missing from the claim language.

Furthermore, the language “the desired resizing” renders the claim indefinite because it suggests a value for which judgments are inherently subjective. In other words, what may be “desired” in one situation may not be what is “desired” in another, etc. Also, there is a lack of antecedent basis for this language.

In claim 2, the language “the desired resizing” and “necessary” fails for similar reasons of indefiniteness and lack of antecedent basis as detailed above.

Claims 4, 8-9, 11-12 and 14-15 are rejected due to at least one similar reason of those detailed above, and should be corrected accordingly.

Claims 2-5, 9-10, 12-13 and 15-16 are also rejected because they inherit the deficiencies of their respective base claims without correcting them, and should be revised accordingly.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-3, 6, 8 and 11-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al (US PGPub No. 20030023811).

For claim 1, Kim discloses a program storage device readable by a computer tangibly embodying one or more programs of instructions executable by the computer to perform a method for dynamically resizing mirrored virtual disks in a RAID storage system, the method comprising:

receiving a request to dynamically resize mirrored virtual disks in a RAID storage system (on-line resizing, in response to user's request, par. 0045; RAID level information representing construction type of the logical volume, par. 040);

manipulating RAIDs in the RAID storage system to provide the desired resizing of the mirrored virtual disk (a method for managing a logical volume in order to support dynamic online resizing, par. 0038; by providing flexibility of mapping, the size of volume can be dynamically increasing and decreasing effectively during operating a system and a RAID level of the volume can be applied to a newly added storage space, par. 0042);

providing the resized mirrored virtual disks for operation (par. 0038, 0042).

For claim 2, Kim further discloses the request to dynamically resize mirrored virtual disks in a RAID storage system is a request to dynamically expand mirrored

virtual disks in a RAID storage system, and wherein the manipulating RAIDs to provide the desired resizing further comprises:

creating an amount of storage necessary by providing RAIDs on each subsystem that is associated with each component of a mirror set (creating a logical volume by rounding up disk partitions in response to a request of constructing the logical volume on a physical storage space, par. 0038; par. 0042);

attaching the RAIDs to a specific virtual disk for a mirror device (a RAID level of the volume can be applied to a newly added storage space, par. 0042); and

specifying a size for the virtual disk and mapping the size of the virtual disk directly to all components of the mirror set (the size of volume can be dynamically increasing and decreasing effectively during operating a system, par. 0042; the present invention maintains a mapping table separately without using a fixed mapping function, par. 0041; a dynamic mapping method for modifying mapping between a logical address used in high-level module and a physical address of physical disk device according to situations, par. 0047; modifying the metadata on the disk partitions participating to the logical volume and calculating and returning a physical address corresponding to a logical address of the logical volume by using mapping information of the metadata containing information of the physical address corresponding to the logical address, par. 0039).

For claim 3, Kim further discloses specifying a size for the virtual disk and mapping the size of the virtual disk as performed by an operating system (the logical volume manager is a virtual intermediate level device driver located above variety of

physical device drivers, uses services of physical device drivers, and is included in a operating system of a computer, par. 0068).

Claim 6 is rejected under the same rationale as per claim 2, where Kim further discloses a program storage device readable by a computer tangibly embodying one or more programs of instructions executable by the computer to perform the method (computer-readable recording medium storing a program or data structure for embodying the method, par. 0001).

Claim 8 is rejected under the same rationale as per claim 1, where Kim further discloses a storage system interface for providing access to a storage system (an interface between a logical volume manager, physical storage devices, and high-level services, par. 0065; fig. 1), host side interface for communicating with host devices (examiner's note: it was well-known in the art at the time of the invention that a method such as dynamic online resizing of logical volumes may involve hosts and an interface for communication with such), and a processor, coupled to the host side interface and the storage system interface (storage system with processor, par. 0039).

Claim 9 is rejected under the same rationale as per claims 2 and 8.

Claim 11 is rejected under the same rationale as per claim 8.

Claim 12 is rejected under the same rationale as per claims 2 and 11.

For claim 13, Kim further discloses specifying a size of a virtual disk and mapping the size of the virtual disk to all components of a mirror set (par. 0068).

Claim 14 is rejected under the same rationale as per claim 8.

Claim 15 under the same rationale as per claims 2 and 14.

Allowable Subject Matter

10. Claims 4-5, 7, 10, 13 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, with all appropriate corrections made.

11. The following is a statement of reasons for the indication of allowable subject matter:

For claims 4-5, 7, 10, 13 and 16, no prior art of record or combination thereof describes "detaching any RAID's that extend beyond the specified size of the virtual disk" nor "truncating RAID's to free up any excess physical segments back into the RAID storage system".

Contact Information

12. Any inquiries concerning this action or earlier actions from the examiner should be directed to Daniel Kim, reachable at 571-272-2742, on Mon-Fri from 10:00am-6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah, is also reachable at 571-272-4098.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information from published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. All questions regarding access to the Private PAIR system should be directed to the Electronic Business Center (EBC), reachable at 866-217-9197.

DK

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STEPHEN C. ELMORE
PRIMARY EXAMINER